

MASTER OF SCIENCE IN SOFTWARE ENGINEERING

RE-ENGINEERING A LEGACY SYSTEM-ISABPS

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During the last decade, software technology advanced so rapidly that more and more legacy systems have failed to keep up with the technology and are no longer supported by industries. Legacy systems are facing the difficult choices of either replacing or re-engineering their existing systems. The goal of this research is to re-engineer the Integrated Submarine Automated Broadcast Processing System (ISABPS) into a new system using object oriented technology. This thesis will describe the re-engineering activities required to transform the current ISABPS procedural design into an object-oriented design and architecture. The result of this thesis will serve as the basis for a future ISABPS implementation.

KEYWORDS: ISABPS, VLF, Legacy, Object-Oriented Design, Three-Tier Architecture

TACTICAL VOICE COMMUNICATIONS OVER SHIPBOARD LOCAL AREA NETWORKS

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The United States Navy's next generation ship(s) scheduled for commissioning in the year 2004 and beyond will integrate tactical shipboard voice communications system into the local area network (LAN). A single network eliminates separate voice and data infrastructures, consolidates services, and reduces the cost of communications. The existing installation of high-speed shipboard data networks has laid the foundation for the convergence of these two technologies.

Currently, there is no high level definition of how multiple system types will share a common infrastructure. Neither is there a baseline defining acceptable end-to-end standards for the merger of these two systems. Common practice for demonstrating feasibility is confined to using commercial-off-the-shelf (COTS) equipment in a show-and-tell environment. Although this indicates certain operational features it does not demonstrate if telephony system's performance are within specified limits. Neither does this type of demonstration simulate realistic shipboard tactical load performance requirements or what effect this integration will have on data systems that co-habitat the LAN.

The purpose of this thesis is to define the convergence of the centralized shipboard tactical voice communications system into a distributed software-based system and the minimum set of acceptable software requirements for full integration of this system into the existing shipboard local area network infrastructure. In addition, this thesis will address the quality of service, tactical requirements risk assessment, interoperability, training, integration with legacy systems and other factors involved in the total cost of ownership.

SOFTWARE ENGINEERING

KEYWORDS: Quality of Service, Private Automated Telephone Switch, Central Office Exchange, Voice Over Broadband, Voice and Data Convergence

